Residual Stress of Sr-doped Lanthanum Titanate Thin Films Grown on LaAlO3 in X-ray Diffraction

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ABSTRACT

In this study, we investigate the residual stress of Sr-doped LaTiO3 (SrxLa1-xTiO3, x = 0.16, 0.49, 0.69 and 0.84) thin films grown on LaAlO3 (001) substrate by X-ray diffraction method. In the experiments, firstly, we used the X-ray ?-2? scan to analyze the crystal structure and the growth direction of the films. We found the films are epitaxial and the c-axis of films is perpendicular to substrate plane. The X-ray ? scans were taken to verify in-plane arrangement of the films, and the data show the films are well fourfold symmetric. The X-ray asymmetry scan were studied to investigate the sin2? dependence of strain. We found the residual stress of SrxLa1-xTiO3 thin films which depend on x are correlated to the electrical transport properties.

Keywords : SrxLa1-xTiO3、residual stress、transport properties

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